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THE EFFECT OF AUDIT COMMITTEE CHARACTERISTICS ON INTELLECTUAL CAPITAL DISCLOSURE

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ABSTRACT

This paper, using data from 100 UK listed firms, investigates the relationship between audit committee characteristics and intellectual capital (IC) disclosure. We find that overall IC disclosure is positively associated with audit committee characteristics such as the size and frequency of meetings, and negatively associated with audit committee directors' shareholding. We find no significant relationship between IC disclosure and audit committee independence and financial expertise. We also observe that the association between audit committee characteristics and IC disclosure varies with the IC components (i.e. human capital, structural capital and relational capital), suggesting that the underlying factors that drive various components of IC disclosure are different. These results have important implications for policy-makers in that they confirm that the effectiveness of audit committees in the corporate reporting processes is a function of certain characteristics.

Key words:

Audit committee characteristics, corporate governance, corporate reporting, intellectual capital disclosure

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1 Introduction

It is generally agreed that audit committees (ACs) play an important role in corporate governance, particularly in enhancing the board of directors' effectiveness in monitoring management (Klein, 2002; Smith Report, 2003; Spira, 2003). In this respect, the literature has emphasised the enhancement of the reporting processes as the distinctive contribution that an effective AC can make (e.g. Forker, 1992; Smith Report, 2003; Mangena & Pike, 2005), thus reducing information asymmetries between management and stakeholders (Mangena & Pike, 2005; Rainsbury, Bradbury, & Cahan, 2008). Previous studies have examined the effect of the presence/absence of AC on financial reporting (Forker, 1992; Beasley, 1996; Peasnell, Pope, & Young, 2001) and earnings management (Peasnell, Pope, & Young, 2005). Other studies, mainly US-based, have examined the association between AC characteristics such as independence, shareholding, financial expertise and size (as measures of its effectiveness) and quality of financial disclosures (e.g. Karamanou & Vafeas, 2005; Mangena & Pike, 2005), external auditor dismissal after issuing a going-concern report (Carcello & Neal, 2003), internet reporting (Kelton & Yang, 2008) and earnings management (e.g. Klein, 2002; Bédard, Chtourou, & Courteau, 2004).¹ In general, the findings of these studies indicate that ACs are important in the financial reporting processes. However, it is not clear whether the results of prior research, particularly those on financial disclosures, extend to intellectual capital (IC) disclosure practices.²

¹ With the exception of Mangena and Pike (2005), the few UK studies examining ACs have focused on the presence/absence of the AC (e.g. Forker, 1992; Peasnell et al, 2005). However, given that the practice of establishing ACs in UK firms is now prevalent (Spira, 2003; Mangena & Pike, 2005), it is now possible to investigate the impact of AC characteristics. We note that the results of US-based studies might not be applicable in the UK context given that the US corporate governance system is more prescriptive than the UK system. Nevertheless, Peasnell, Pope, and Young (2003) and Peasnell et al. (2005) note that although the two corporate governance systems are different, the UK approach shares many of the key features of the US system.

² IC is defined by CIMA (2001, p. 2) as *"the possession of knowledge and experience, professional knowledge and skill, good relationships, and technological capacities, which when applied will give organisations competitive advantage."* It comprises three major components: human capital, structural capital and relational capital (e.g. Beattie & Thomson, 2007; Guthrie, Petty, & Ricceri, 2007).

In a review of the state of financial and external reporting research, Parker (2007) identified IC accounting research as a major area for further study. This is because firms make significant investments in IC related assets such as R&D, brand development, human development and advertising. These IC related assets are critical in (1) a firm's value-creating activities (e.g. Aboody & Lev, 2000; Chaminade & Roberts, 2003; Habersam & Piber, 2003) and (2) building competitive advantage and creating shareholder value (e.g. Bukh, 2003; Holland, 2003). However, because the existing GAAP allows IC investments to be expensed immediately, financial reports fail to reflect adequately such value-creating assets (Lev & Zarowin, 1999). This gives rise to increasing information asymmetry between firms and users of financial reports (Barth, Kasznik, & McNichols, 2001). Consequently, both academics and regulators have called for firms to enhance the disclosure of IC information (see e.g. FASB, 2001; Beattie, McInnes, & Fearnley, 2004), which reduces investors' uncertainty about future prospects and facilitates a more precise valuation of the company (Barth et al., 2001; Bukh, 2003; Holland, 2003; 2006). In the context of these calls, the aim of this study is to investigate whether corporate governance mechanisms, in particular the AC, influence the intellectual capital disclosure practices of UK listed IC-intensive firms. Specifically, the study examines the relationship between AC characteristics (size, frequency of meetings, independence, shareholding, and financial expertise) and IC disclosure in annual reports. Additionally, the study examines the relationship between AC characteristics and the extent of disclosure in the individual IC components: human capital, structural capital and relational capital.

The expectation that the AC would influence IC disclosure derives from the notion that corporate governance mechanisms are designed to reduce agency problems (Fama & Jensen, 1983), and enhancing disclosures is perceived as one way of reducing these agency problems (Healy & Palepu, 2001). For our study, we believe that the UK provides an appropriate environment in which to examine the relationship between IC disclosure and AC

characteristics because there are no stringent corporate governance and disclosure requirements, as exist for example in the US (Peasnell et al., 2003). The ‘comply or explain’ approach to corporate governance adopted in the UK implies that there is a likelihood of greater variation in both corporate governance structure and disclosure among firms.

A number of studies examine the extent of IC disclosure (e.g. Brennan, 2001; Beattie et al., 2004; Beattie & Thomson, 2007; Li, Pike, & Haniffa, 2008; Striukova, Unerman, & Guthrie, 2008). These studies generally show that although IC disclosure is still low, there has been an increase in IC disclosure over the years. There are also studies investigating the relation between IC disclosure and company-specific characteristics (such as firm size, industry) (e.g. Bozzolan, Favotto, & Ricceri, 2003; Striukova et al., 2008) and corporate governance (e.g. Cerbioni & Parbonetti, 2007; White, Lee, & Tower, 2007; Li et al., 2008; Singh & Van der Zahn, 2008). The studies on the link between corporate governance and IC disclosure have mostly focused on board independence and ownership structure with limited systematic investigation being directed towards the role of the AC in influencing IC disclosure. This is surprising because of the perceived critical role that the AC plays in overseeing the corporate reporting process (see Smith Report, 2003).

The present study contributes to the literature in a number of ways. First, it provides the first systematic evidence on the relationship between AC characteristics and IC disclosure. At the overall IC disclosure level, the results show that IC disclosure is greater for firms with ACs that are larger and meet more frequently, but lower for firms whose AC members have large shareholdings. However, there is no significant relationship between IC disclosure and AC independence and financial expertise. Second, the study provides evidence on the relationship between AC characteristics and each of the three IC disclosure components: human capital, structural capital, and relational capital. The results show that AC size is positively associated with all three IC disclosure components, whilst the frequency of AC meetings is related to

structural and relational capital disclosure. AC directors' shareholding is only related to structural capital disclosure. These results appear to suggest that the underlying factors that drive various forms of IC disclosure are different. On the whole, the findings show the importance of an independent (in terms of shareholdings) and well-resourced (in terms of size and frequency of meetings) AC in the reporting of IC information to the stock market.

The remainder of this paper is organised as follows. Section 2 discusses the motivations for IC disclosure and Section 3 outlines the hypotheses. Section 4 discusses the research methods. The empirical results are reported in Section 5 and, finally, Section 6 concludes.

2 Motivations for IC disclosure

The importance of IC information to stock market participants' investment decision-making processes is well documented in the literature. For example, Holland (2003; 2006) find that analysts and fund managers demand and use IC information in their investment decisions and valuation of firms. Other studies show that specific IC indicators, such as capitalisation of R&D costs (Aboody & Lev, 2000), customer satisfaction (Ittner & Larcker, 1998) and market penetration (e.g. Amir & Lev, 1996) have an impact on share prices and market values, suggesting that investors find them relevant for share valuation.

In the context of the importance of IC, managers should have incentives to provide greater IC disclosure to support the stock market. Fama and Jensen (1983) argue that the separation of ownership and control in the modern firm creates information asymmetries between the managers and the outside investors. This increases agency costs such as reduced liquidity of the company's shares, management reputation, and higher cost of capital (Healy & Palepu, 2001). Healy and Palepu (2001) suggest that increased disclosure reduces information asymmetry resulting in lower agency costs. Aboody and Lev (2000) argue that the information asymmetry between managers and investors is more acute for investments in IC than for investments in physical and financial assets, because IC is unique to specific firms and cannot

be inferred by looking at other firms. Additionally, unlike investments in physical and financial assets, IC reporting is largely unregulated. Francis and Schipper (1999) argue that the absence of regulation is compounded by the fact that existing GAAP mandates that most investments in IC are immediately expensed in the period in which they are incurred. Consequently, while investors are regularly informed about changes in physical and financial assets via mandatory annual and interim reports, there is relatively scarce public information about IC investments. This creates a problem for investors when undertaking share valuation because they have little or no information about the productivity and value changes of IC investments. In this context, enhancing IC disclosures can be seen as an attempt by managers to reduce information asymmetry, thus reducing the cost of capital (Healy & Palepu, 2001). As is found in Beattie and Thomson's (2010) survey, firms are motivated to report IC information by market-related incentives, in particular the opportunity to increase transparency and help reduce undervaluation of the firm's share price. Consistent with this, Kristandl and Bontis (2007) and Mangena, Pike, and Li (2010) show that firms engaging in greater IC disclosure have a lower cost of capital.

There are, however, potential costs of disclosure that may prevent managers from disclosing IC information, such as the danger of setting a disclosure precedent which may be difficult to maintain (e.g. Habersam & Piber, 2003). Proprietary costs, such as releasing valuable information to competitors, may also deter managers from enhancing IC disclosures. As Beattie and Thomson (2010) find, managers consider the release of information that might harm competitive position and setting disclosure precedence as key disincentives of voluntary IC disclosure. To the extent that the benefits of IC disclosure outweigh the costs, managers are more likely to have incentives to enhance disclosure. Nevertheless, managers may still have incentives to withhold IC information because lack of information hinders the ability of the capital and labour markets to monitor managers effectively (Karamanou & Vafeas, 2005). In

this study, we focus on the role of the AC in enhancing the extent of IC information disclosure.

3. Hypotheses Development

Cerbioni and Parbonetti (2007) and Li et al. (2008) suggest that corporate governance mechanisms, particularly board structures, are important in shaping corporate IC disclosure strategies. Holland (2006) finds that boards of directors have active roles in disclosure processes related to the provision of IC information. In line with this, the UK Corporate Governance Code (UK Code, 2010: 18) sets out one key responsibility of the board as to present a balanced and understandable assessment of the company's financial performance, position and prospects, including providing 'an explanation of the basis on which the company generates or preserves value over the longer term (the business model) and the strategy for delivering the objectives of the company'. These reporting responsibilities of the board are operationalised through the AC (Smith Report, 2003; Mangena & Pike, 2005; Peasnell et al., 2005). Both the Smith Report (2003) and the Blue Ribbon Committee (1999) view the AC as the ultimate monitor of the corporate reporting process. The AC is thus regarded as the monitoring mechanism that reduces information asymmetries between a firm's management and outside board members (Rainsbury, et al., 2008). In this context, the AC is seen as improving the board's role of monitoring management (Peasnell et al., 2005) and consequently the alignment of management's interests with those of shareholders. The UK Code (2010) recommends that ACs should review the reporting issues and judgments made in connection with the preparation of the financial statements and any related formal statements. Consistent with this, recent evidence shows that the AC plays an important role in the assurance of social and environmental reporting (Jones & Solomon, 2010), which overlaps with IC disclosure (see e.g. Cordazzo, 2005). Beattie, Fearnley, and Hines (2008) report on the increasing focus on intangible asset issues by the AC chairman, thus stressing the increasing importance of IC and its related information at the board and AC level.

3.1 Audit Committee Characteristics

The literature suggests that the effectiveness of the AC is enhanced when the AC is well resourced, independent and has members with financial expertise (e.g. Smith Report, 2003; Mangena & Pike, 2005). Therefore, we develop hypotheses regarding the effect of five AC characteristics (size, frequency of meetings, independence, AC directors' shareholding, and financial expertise) on IC disclosure practices.

3.1.1 Size of Audit Committee (SAC)

In order to perform their role effectively, ACs should have adequate resources and authority to discharge their increasing responsibilities (DeFond & Francis, 2005; Mangena & Pike, 2005; FRC, 2008). Bédard et al. (2004) argue that the larger the AC, the more likely it is to uncover and resolve potential problems in the financial reporting process, because it is likely to provide the necessary strength and diversity of views and expertise to ensure effective monitoring. This suggests that AC size is an integral factor for firms in delivering meaningful corporate reporting (Klein, 2002). However, it can also be argued that as the number of AC members increases, each may be comforted by the presence of others and free riders emerge (Klein, 2002; Karamanou & Vafeas, 2005). In addition, larger ACs are also likely to suffer from process losses and diffusion of responsibility (Karamanou & Vafeas, 2005). The Smith Report (2003) recommends a minimum of three non-executive directors. Empirically, the evidence is mixed. Some studies find AC size to be associated with lower earnings management (e.g. Yang & Krishnan, 2005; Cornett, McNutt, & Tehranian, 2009), whilst others fail to find a significant relationship with earnings management (e.g. Bédard et al., 2004) and voluntary disclosure in interim reports (Mangena & Pike, 2005). Given the mixed results, we hypothesise that:

H1: There is no relationship between the level of IC disclosure and AC size, ceteris paribus.

3.1.2 Frequency of Audit Committee Meetings (MAC)

Karamanou and Vafeas (2005) argue that ACs that meet more frequently would have more time

to perform the role of monitoring the corporate reporting process efficiently. Agrawal and Chadha (2005) opine that it may be difficult for a small group of outsiders to detect fraud or accounting irregularities in a large, complex corporation in a short time. In this case, adequate meeting time by the AC should be devoted to the consideration of major issues (e.g. Smith Report, 2003; Raghunandan & Rama, 2007). This also sends a signal of the committee's intention to remain informed and vigilant (McMullen & Raghunandan, 1996). For this reason, the FRC (2008: 6) states that 'Formal meetings of the audit committee are the heart of its work' and 'Sufficient time should be allowed to enable the audit committee to undertake as full a discussion as may be required'. The FRC (2008) recommends that ACs should hold a minimum of three or four meetings a year. Empirical evidence shows a negative relationship between frequency of AC meetings and earnings restatement (e.g. McMullen & Raghunandan, 1996) and earnings management (e.g. Cornett et al., 2009), and a positive relationship with internet financial reporting (Kelton & Yang, 2008). Therefore, we hypothesise the following:

H2: There is a positive relationship between the level of IC disclosure and frequency of AC meetings, ceteris paribus.

3.1.3 Audit Committee Independence (INED_AC)

The argument that AC independence is important draws from the widely accepted notion that independent directors are more likely to be effective monitors of management actions (e.g. Fama & Jensen, 1983). According to Carcello and Neal (2003) and Mangena and Pike (2005), independent ACs are more likely to be free from management influence. Hence, they will ensure the quality and credibility of the reporting process, thus reducing information asymmetry. Since IC information plays an important role in the share valuation activities of the stock market (see Aboody & Lev, 2000; Holland, 2003), an independent AC would enhance the provision of such information for the benefit of the investors. The UK Code (2010) recommends that an AC should be comprised of at least three (or in the case of smaller companies, two) members, who should all be independent non-executive directors.

On the empirical front, evidence is mixed. Some studies find that AC independence is positively associated with financial reporting quality (e.g. McMullen & Raghunandan, 1996; Mangena & Tauringana, 2007), whilst others fail to find a significant relationship (e.g. Agrawal & Chadha, 2005; Yang & Krishnan, 2005). In spite of the mixed results, we expect a positive relationship between AC independence and IC disclosure. Our rationale for this is that unlike other disclosures that are regulated, IC reporting is largely unregulated. This creates greater information asymmetry about IC information (Aboody & Lev, 2000; Holland, 2003) and opportunities for increased moral hazard, adverse selection and other opportunistic behaviour by managers (Aboody & Lev, 2000). To the extent that independent directors monitor managers effectively, we expect independent ACs to influence IC disclosure positively. Therefore, we hypothesise that:

H3: There is a positive relationship between the level of IC disclosure and the independence of ACs, ceteris paribus.

3.1.4 Audit Committee Directors' Shareholding (ADISH)

The arguments on the effect of share ownership by AC members are twofold. On the one hand, in line with agency theory, directors with high share ownership should have interests that are more aligned with shareholders and may have stronger incentives to monitor the management (e.g. Karamanou & Vafeas, 2005; Mangena & Pike, 2005). On the other hand, greater director shareholding could lead to entrenchment. In this case, high shareholdings by AC members may weaken their independence and oversight ability; cause them to act in their own interest at the expense of other shareholders; and hence affect their effectiveness (Mangena & Pike, 2005).

Yang and Krishnan (2005) find a positive association between share ownership by independent AC directors and quarterly earnings management. Mangena and Pike (2005) report a significant negative relationship between disclosure in interim reports and AC directors' shareholding. Bronson, Carcello, Hollingsworth, and Neal (2009) find a positive relation between AC directors' shareholding and auditor dismissal. These results suggest that higher

share ownership is detrimental to the independence of the AC members. Consequently, the UK Code (2010: 22) recommends that firms should not remunerate non-executive directors with share options or other performance-related elements, arguing that ‘Holding of share options could be relevant to the determination of a non-executive directors’ independence’. We therefore hypothesise the following:

H4: There is a negative relationship between the level of IC disclosure and the level of AC directors’ shareholding, ceteris paribus.

3.1.5 Audit Committee Financial Expertise (FEXP_AC)

The need for the AC to be composed of members with financial expertise was emphasised in the Smith Report (2003). Consequently, the UK Code (2010) recommends that at least one AC member should have recent and relevant financial experience. The rationale for this is that financial expertise will help the AC members to understand the auditors’ judgements and discern the substance of disagreements between management and external auditors (Mangena & Pike, 2005; Raghunandan & Rama, 2007). In addition, it will improve AC effectiveness in identifying and asking questions that ‘make management think harder and auditors dig deeper’ (Levitt, 2000). Knapp (1987) contends that if the AC does not possess the expertise to understand technical auditing and corporate reporting issues, its oversight role is likely to be discounted by the auditor and management. This would undermine the effectiveness of the AC in the financial reporting process.

We argue that ACs with financial expertise are likely to be in a better position to understand the capital market implications of providing quality IC disclosures. Such understanding by the AC should lead to improvement in IC disclosure in order to communicate information on firms’ value creating processes. As Beattie and Thomson (2010) document, the incentive for directors in disclosing IC information is to support the valuation activities of the stock market participants. Prior empirical studies indicate a negative relation between financial expertise and financial statements fraud (e.g. Abbott, Park, & Parker, 2000), earnings

management (Klein, 2002), dismissal of auditors after issuing a going-concern report (Carcello & Neal, 2003), and a positive relationship with disclosure (e.g. Mangena & Pike, 2005; Mangena & Taurigana, 2007). This leads us to the following hypothesis:

H5: There is a positive relationship between the level of IC disclosure and financial expertise on the AC, ceteris paribus.

3.2 Control Variables

To test the hypotheses, we control for a number of other variables. First, Klein (2002) argues that AC independence and effectiveness are embedded within the larger board, and it is important to control for overall board independence. As Beasley (1996) documents, the presence of the AC does not affect the likelihood of fraud, but the proportion of non-executive directors has a significant negative effect. Other studies show that board independence is negatively associated with earnings management (e.g. Klein, 2002; Cornett et al., 2009) and positively associated with corporate disclosures, including IC disclosure (e.g. Cerbioni & Parbonetti, 2007; Patelli & Prencipe, 2007; Li et al., 2008). Thus, we predict a positive relationship. Second, the literature suggests that large outside blockholders have access to managers and therefore to the information they need, especially IC information (Cormier, Magnan, & Van Velthoven, 2005; Holland, 2006). In this respect, they might not influence public disclosure. We therefore expect a negative relationship between IC disclosure and share ownership concentration. Third, we control for firm size, which has consistently been found to be associated with disclosure (see Mangena & Pike, 2005; Li et al., 2008). Fourth, the literature suggests that information asymmetry is likely to be higher for younger or newly listed firms (Li et al., 2008; Singh & Van der Zahn, 2008). Hence younger listed firms will provide greater IC disclosures to reduce the scepticism and boost confidence of investors who may perceive them as more risky (Haniffa & Cooke, 2002; Bozzolan et al., 2003). Finally, profitability may be the result of continuous investment in IC and firms may engage in higher disclosure of such information to signal the quality of their decisions in investing for long-term growth in the

value of the firm. We therefore expect a positive relationship.

4 Research Design

4.1 Sample Selection

The sample of this study is limited to UK IC-intensive sector companies that were fully listed on the London Stock Exchange (LSE) as at 30 December 2005. The sectors considered to be IC-intensive are pharmaceuticals & biotechnology, IT, media & publishing, business services providers, telecommunications, banking & insurance, and food production & beverage (see also Guthrie et al., 2007; Striukova et al., 2008). The choice of sectors derives from the fact that the existing financial reporting model is not suited for IC-intensive sectors (Amir & Lev, 1996; Francis & Schipper, 1999) and therefore, the role of IC information in firm valuation by the capital market participants is particularly critical for companies in these sectors. Consequently, we expect the role of the AC in enhancing IC disclosure to be much more important in these firms in order to address the critical information asymmetries caused by the weaknesses in the financial reporting model. The population size for the seven IC-intensive sectors on the LSE was 319 companies, from which a sample of 100 was selected.³

To select the sample, we apply proportionate stratified sampling (Moser & Kalton, 1996) to ensure that we build a sample that is representative of the sectors selected and the size of the firms.⁴ We considered that as the number of firms in each industry group is not the same (see Table 1, column 3), simple random sampling will not meet this objective. The selection process thus involved two steps. First, we computed the number of companies required from each of

³ In determining the sample of 100 firms, we apply the formula suggested in Moser and Kalton (1996), i.e. $n = \pi (1-\pi)/[S.E. (p)]^2$, where n = required sample size; π = proportion of the particular attribute in the population (estimated at 50%, a value that is always assumed to be the maximum variance); and $S.E. (p)$ = the standard error that is allowed for the study (set at 5%). The sample size is 100, which is considered appropriate for the 10 independent variables included in the regression model (see Stevens, 1996).

⁴ Based on stratified sampling, the population is divided into two or more relevant and significant strata based on one or a number of attributes (Moser & Kalton, 1996). A sample is then selected from each stratum separately, producing a stratified sample. The sample size is usually proportionate to the relative size of the strata.

the seven sectors (see Table 1, columns 4 and 5). Second, to ensure that our sample includes both large and small firms, we ranked companies in each sector by market capitalisation and then systematically selected one firm from every three firms in each industry grouping.

[Table 1 insert here]

4.2 IC Disclosure Measures

The IC disclosure measures were developed from the annual reports published in the financial year-ends ranging from March 2004 to February 2005. The choice for this period was driven by the desire to eliminate the possible disclosure effects of the OFR requirements, which were to become effective early 2005.⁵ We took the view that using annual reports published prior to, instead of after the mandatory OFR, allowed a clearer determination of voluntary IC disclosure and would result in greater variations in the disclosure measures. Variation is necessary in regressions examining disclosure (Gietzmann & Ireland, 2005). Although there are various other communication channels, such as the corporate website and analyst presentations, the use of the annual report to measure corporate disclosure is widely adopted and well justified in the literature (see e.g. Gray, Kouhy, & Lavers, 1995; Bozzolan et al., 2003).

To measure IC disclosure, we employ content analysis, a method that has been applied by prior studies in measuring IC disclosure (Beattie & Thomson, 2007; Li et al., 2008). We apply the 61-IC-item checklist developed by Li et al. (2008), which provides a comprehensive list of voluntary IC items divided into human, structural and relational items (see Appendix A). The scoring of the annual reports against the checklist was performed manually by reading the

⁵ The statutory requirement for quoted companies to publish an OFR was repealed in January 2006. The requirements of an OFR cover some of the issues relevant to IC, particularly human and relational capital. Instead, companies are now required to include Business Review in the Director's Report, which is a reduced version of OFR. It requires quoted companies to include information about 'environmental matters, the company's employees, and social and community issues' (Companies Act, 2006, 417, 5b) and an analysis using financial and other key performance indicators (KPI) (Companies Act, 2006). However, the Companies Act (2006) does not stipulate any particular KPIs and issues related to employee, environment and social and community, that companies have to include in the business review. Hence, the selection of KPIs and issues to be discussed in the review are at the discretion of the directors.

whole annual report. Each IC item was scored based on three presentational formats (i.e. text, numerical and graphical/pictorial), thus receiving a maximum of three points.⁶ This means that a firm can score a maximum of 183 points (i.e. 61 IC items \times 3 formats). After scoring all 61 IC items in the three presentational formats, the IC disclosure score(s) for each company are computed as an index by dividing the sum of items disclosed (adding all the 1s) by the total number of items expected (total count of all the 1s and 0s) (see Haniffa & Cooke, 2002). For each company, we created four disclosure indices to capture the overall IC (ICDI), human capital (HICDI), structural capital (SICDI) and relational capital (RICDI) disclosure.

The scoring process was mainly completed by one researcher. This raises questions about reliability of the scores in that they may only reflect that person's conception of reality (Gray et al., 1995), rather than any potential objective reality that exists in relation to IC disclosure (Beattie & Thomson, 2007). Therefore, seven annual reports were randomly selected and recoded by another two independent coders.⁷ Krippendorff's (1980) alpha was computed to test for reliability because it can account for chance agreement among multiple coders. The independent scores (not tabulated) are all above the minimum 80% threshold considered reliable for content analysis (Krippendorff, 1980).

4.3 Models

Multiple regression analysis is used to test the relationship between IC disclosure and the AC characteristics and control variables. We run the following regression model separately for the overall IC disclosure (ICDI), human capital disclosure (HICDI), structural capital disclosure (SICDI) and relational capital disclosure (RICDI) indices.

⁶ The approach we adopt in scoring is essentially dichotomous in that an item (i.e. each of the three presentational formats of an IC item) scores 1 if disclosed and 0 if it is not. We do not attach weights because the literature (e.g. Haniffa & Cooke, 2002; Mangena & Pike, 2005) shows that attaching weights to disclosure items does not influence the results.

⁷ We randomly selected one annual report from each of the sectors included in our sample in a bid to ensure that reliability is tested on all the sectors. We considered one annual report from each sector to be sufficient for the purpose.

$$IC\ Disclosure = \beta_0 + \beta_1 SAC + \beta_2 MAC_i + \beta_3 INED_AC + \beta_4 LnADISH + \beta_5 FEXP_AC + \beta_6 INED + \beta_7 SqSCON + \beta_8 LnAGE + \beta_9 ROA + \beta_{10} LnSA + \varepsilon_i$$

All variables are as defined in Table 2.

[Table 2 insert here]

5 Empirical Results

5.1 Descriptive analysis

Table 3 Panel A presents the descriptive statistics of IC disclosure indices, at the overall, component and industry level.⁸ Consistent with prior studies (e.g. Brennan, 2001; Bozzolan et al., 2003; Striukova et al., 2008) the level of IC disclosure is low. The mean index for overall IC disclosure is 0.36 (ranging from 0.16 to 0.56) (i.e. 36% of 183 format items were disclosed). As for the components of IC, firms appear to provide slightly greater structural capital information at 37.1% than both relational and human capital disclosures at 36.5% and 35.5%, respectively. At the industry level, we observe that the banking & insurance sector provides the highest level of IC disclosure whilst the IT sector provides the lowest. However, the Kruskal-Wallis test shows no significant difference in IC disclosure scores among the seven sectors indicating that for our sample of firms, the industry sector does not influence the level of IC disclosure.⁹

[Table 3 insert here]

In Panel B of Table 3, the summary descriptive statistics for the independent variables are presented. Focusing on the AC, the mean AC size is approximately three members, consistent with the recommendation of the UK Code (2010). We observe that ACs meet, on average, about four times per year. The average proportion of independent AC directors is 85%, suggesting that ACs in the majority of firms are comprised of members who are independent. On the whole, we observe that 59% of the sample firms have ACs comprised solely by

⁸ For industry, we only provide the descriptive statistics for the overall IC disclosure for easy and clear presentational purposes.

⁹ We also run a multiple regression analysis in which we included the industry dummy variables and find that none of the industries are significant (results are not included here).

independent non-executive directors. The mean AC directors' shareholding is 1.6%, ranging from a minimum of 0% to a maximum of 51.4%.¹⁰ The results also show that 85% of the ACs in the sample firms have members with financial expertise. In terms of the control variables, the mean for significant shareholding is 29.6% and board independence is 47.5% suggesting non-compliance with the recommendation of the UK Code (2010) for at least half of the board to be independent non-executive directors.¹¹ The mean size of the firm is £4,036.7 million and the average listing age is 17 years, whilst the average profitability is 4.4%.

5.2 *Multiple Regression Results*

Prior to running the multiple regression analysis, we first examine our data to detect violations of normality and also examine whether multicollinearity was a problem among independent variables. We find that, whilst all the dependent variables are normally distributed, based on both standard tests on skewness and kurtosis and Kolmogorov-Smirnov Lilliefors test (not tabulated), some of the independent variables (i.e. AC directors' shareholding, share ownership concentration, listing age and firm size) are not. These were transformed using the natural log and square root transformations.¹² For multicollinearity, we examine the correlations among the independent variables. In Table 4, we present the correlation and partial correlation (controlling for firm size) matrices between the dependent and independent variables. It can be seen from Panel A that the associations between independent variables are all below 0.80.¹³

¹⁰ There are six firms in which the chairman of the board, who also sits on the AC, has a significant amount of shareholding. An extreme case is where the chairman held 45.8% of the firm's shares. In these firms, the AC shareholding ranges between 3% and 51.4%. These firms appear to be smaller firms. If we exclude these firms, the mean AC shareholding is about 0.3%.

¹¹ However, smaller firms can have at least two independent non-executive directors.

¹² AC directors' shareholding, listing age and firm size are transformed using natural log transformation (i.e. LnADISH, LnAGE, LnSA), whereas square root transformation is more effective for share concentration (SqSCON). The transformed variables all indicate normality of distribution (not tabulated).

¹³ The 'rule of thumb' for checking problems of multicollinearity using a correlation matrix is that multicollinearity becomes a problem when the correlation is >0.80 (Belsley, Kuh, & Welsch, 1980). The correlation coefficient of -0.663 between LnSA and LnADISH is the highest amongst all, which is still within the threshold.

Table 4 Panel B reveals that after controlling for firm size, all associations between the independent variables are also below 0.80. We also examine the variation inflation factors (VIF) (see Table 5) and find that they are all less than 3, suggesting that multicollinearity is not a problem.¹⁴

[Table 4 insert here]

In Table 5, the regression results of the relationship between the AC characteristics and IC disclosure are presented. Model 1 presents the results of the overall IC disclosure (ICDI) model, whilst Models 2, 3 and 4 present the results for the individual components of IC disclosure, that is, human capital (HICDI), structural capital (SICDI) and relational capital (RICDI) disclosure, respectively. All the models have significant explanatory power. The adjusted R^2 s range from a lower of 40.8% for HICDI to the highest of 63.1% for ICDI.

[Table 5 insert here]

In respect to our main variables, the results show that AC size (SAC) is significantly and positively associated with the overall IC disclosure and all three IC disclosure components at the 5% level or better. Thus the null hypothesis H1 is rejected. This is consistent with findings from Yang and Krishnan (2005) and Cornett et al. (2009) on earnings management, but not with Bédard et al. (2004) on earnings management and Mangena and Pike (2005) on financial reporting quality.¹⁵ Nonetheless, these findings support the argument that when ACs are well resourced, their effectiveness is enhanced (DeFond & Francis, 2005; FRC, 2008). In this case, we argue that larger AC means the ability to effectively oversee the information provided in documents such as the OFR (Smith Report, 2003), which typically has a strong IC disclosure

¹⁴ Previous authors suggest multicollinearity becomes a serious problem where VIFs exceed 10 (Belsley et al., 1980). Further, the condition indexes, using eigenvalues of the independent variables correlation matrix, were also acceptable with all being below 30 (not tabulated).

¹⁵ Bédard et al. (2004) measure AC using a dummy variable, which could have contributed to the different result. Although Mangena and Pike (2005) find no significant relation, the direction of the coefficient is positive as in this study.

emphasis, is improved.

The frequency of AC meetings (MAC) is positively associated with overall IC disclosure and structural capital and relational capital disclosure at the 5% level or better, thus supporting hypothesis H2. The frequency of AC meetings has also been found to be associated with more management earnings forecasts (Karamanou & Vafeas, 2005), less earnings management (Cornett et al., 2009) and earnings restatement (McMullen & Raghunandan, 1996). The results imply that AC activity is an important factor in enhancing IC disclosure in order to reduce information asymmetry. These results are consistent with corporate governance recommendations (e.g. UK Code, 2010) that the AC should meet more frequently. More frequent meeting would mean high-level oversight of all corporate reporting issues, including IC disclosure. However, we do not find a significant relationship between human capital disclosure and frequency of AC meetings. This is puzzling, but it is possible that structural and relational capital related issues are more likely to be company-specific, and hence require more time for discussion than human capital related issues.

We observe that AC independence (INED_AC) is not significantly associated with any of the IC disclosure indices. These results are inconsistent with our prior expectations in hypothesis H3 and contradict other previous studies (e.g. Mangena & Taurigana, 2007) showing a positive relationship between AC independence and corporate compliance with non-mandatory best practice statements. However, the results support the findings of Agrawal and Chadha (2005) and Yang and Krishnan (2005), who also fail to detect a significant relationship. These findings suggest that AC independence does not affect IC disclosure. We observe that although not significant, the direction of the relationship is negative for overall IC disclosure, structural and relational capital disclosure, but positive for human capital disclosure. One possible explanation is that independent ACs may be more mindful of avoiding releasing proprietary information to competitors. For example, information relating to

structural capital (such as intellectual property, R&D) and relational capital (such as customers, favourite contracts) may be used by competitors. However, for human capital, independent AC members may encourage disclosure as a public relations tool in order to attract quality employees as well as retaining existing employees.

The results for AC directors' shareholding (LnADISH) are negative and significant at the 5% level, but only for the overall IC disclosure and structural capital disclosure, thus hypothesis H4 is supported for these two indices.¹⁶ The relationship between human and relational capital disclosure indices and AC directors' shareholding is not significant. The negative results, for overall IC disclosure and structural capital disclosure, are consistent with previous studies (e.g. Mangena & Pike, 2005; Yang & Krishnan, 2005) and suggest that greater IC disclosure is less likely when AC members hold greater shareholding. This suggests that share ownership compromises the AC's independence and therefore the motivation to effectively monitor the reporting processes. The implication of this is that greater share ownership by AC directors is undesirable, thus supporting the UK Code's (2010) recommendation that remuneration for non-executive directors should not include share options or other performance-related elements. We suggest that in judging the independence of the AC, it is important to consider the level of shareholding of the AC members than merely considering the proportion of independent non-executive directors on the AC.

Finally, the relationship between AC financial expertise (FEXP_AC) and IC disclosure is negative and significant at the 10% level, but only for structural capital disclosure. Hence, hypothesis H5 is not supported. The results are surprising and do not support previous studies showing a negative relationship with earnings management (Klein, 2002) and dismissal of auditors after issuing a going-concern report (Carcello & Neal, 2003), and a positive relationship with disclosure (e.g. Mangena & Pike, 2005; Mangena & Taurigana, 2007). The

¹⁶ We re-run the regression with a reduced number of firms by excluding six firms in which the AC share ownership is too high, i.e. firms with individual AC members holding $\geq 3\%$ of ordinary shares. The results are maintained.

findings also do not support the Smith Report (2003) and UK Code's (2010) recommendations that the AC should have members with financial expertise. It may well be that financial expertise is more relevant for financial related issues than for IC reporting issues. Some of the IC elements (for example, R&D, quality management and improvement) might require other specialist knowledge instead of financial expertise to understand.

In terms of the control variables, we find that board independence (INED) is positively associated with structural capital disclosure at the 5% level, and only at the 10% level with overall IC and relational capital disclosure. No significant relationship is detected for human capital disclosure. The positive association is generally consistent with the previous findings on IC disclosures (e.g. Cerbioni & Parbonetti, 2007; White et al., 2007), suggesting that the presence of independent non-executive directors on the board improves the monitoring of management actions. Share ownership concentration (SqSCON) shows a significant negative association with overall IC disclosure and structural capital disclosure at the 5% level, but no significant relationship with relational and human capital disclosure. The negative coefficients suggest that enhanced IC disclosure is less likely in firms with higher share ownership concentration. The results are consistent with prior studies (e.g. Cormier et al., 2005; Patelli & Prencipe, 2007). A possible reason is that large shareholders obtain the information in private meetings (see Holland, 2003) and therefore would not demand firms to enhance public disclosure of the information. We also find that listing age (LnAGE) is negatively and significantly associated with overall IC disclosure, human capital disclosure and relational capital disclosure at the 5% level. This provides evidence for signalling theory in that younger listed firms are more inclined to provide IC disclosure to help reduce uncertainty and lower the cost of capital (see Singh & Van der Zahn, 2008). Profitability (ROA) shows a significant positive association with overall IC disclosure and relational capital disclosure at the 5% level and with structural capital disclosure at the 10% level. The finding adds to the literature on

profitability effect on IC disclosure (e.g. García-Meca & Martínez, 2005; Cerbioni & Parbonetti, 2007). Finally, as would be expected, firm size (LnSA) shows a significant positive relationship with all IC disclosure indices, except for structural capital, at the 1% level.

5.3 *Sensitivity Analysis*

Taken overall, our results suggest that AC characteristics of size, frequency of meetings and committee directors' shareholding are related to IC disclosure, but AC independence and financial expertise are not. We conduct additional analyses to check the robustness of our results. First, we re-run the regressions by introducing two alternative measures of AC independence. For one alternative measure, we create a dummy variable taking the value of 1 if the committee is comprised solely of independent non-executive directors and 0 otherwise (e.g. Bédard et al., 2004). For the other alternative measure, we use the mean score of AC independence as the cut-off point and create a dummy variable taking the value of 1 if equal or greater than the mean and 0 otherwise. In both cases our results are largely similar. Second, we introduce an additional variable, company chairman on AC, measured as a dummy variable taking the value of 1 if chairman of the board sits on the AC and 0 otherwise. The Smith Report (2003: para. 3.2) recommends that 'the chairman of the company should not be an audit committee member'.¹⁷ We expect that the presence of the company chairman on an AC dilutes its independence and effectiveness. We also include board size in the model following Cerbioni and Parbonetti (2007). In both instances, our results are not significantly altered and both company chairman on AC and board size are not significantly related to IC disclosure. Finally, we introduce both board size and company chairman on AC in one model and our results remain largely the same. These additional analyses suggest that our results are robust to alternative measures and to the inclusion of additional variables.

¹⁷ Chairmen of smaller listed firms are now allowed to be members of the AC if they were considered independent on appointment (see UK Code, 2010).

6 Summary and Conclusions

The AC is a sub-committee of the board with the key responsibility for monitoring the corporate reporting processes in order to support the overall board's monitoring role of management actions. In this respect, the AC's role is not only about the financial reporting process, but it extends to the reporting of non-financial information including IC information. To the extent that IC information is important for the valuation of the firm's shares, we argue that the AC would influence its disclosure to the stock market to reduce the acute information asymmetry associated with the value creation capabilities of IC assets. Consequently, in this paper, we examine the role of the AC in enhancing the disclosure of IC information in the annual reports of UK listed IC-intensive firms. Specifically, we investigate the relationship between AC characteristics and IC disclosure. We find AC size and frequency of meetings to be positively related to IC disclosure. We also find that AC directors' shareholding is negatively related to IC disclosure. Except for AC size, the results are mixed for the components of IC disclosure: human capital, structural capital and relational capital disclosure. Surprisingly, we find no significant relationship between IC disclosure and AC independence and financial expertise. Nevertheless, on the whole the results are consistent with the notion that the role of ACs in monitoring the corporate reporting processes extends to non-financial information such as IC disclosure. In particular, the effectiveness of the AC is dependent on its resources in terms of size and frequency of meetings and the level of committee members' share ownership. Higher share ownership by AC members could be detrimental to the monitoring of the corporate reporting processes by the AC.

In line with the world-wide efforts to improve the effectiveness of ACs in overseeing the financial reporting process (see Blue Ribbon Committee, 1999; Smith Report, 2003), our results are of interest to policy-makers. The results are consistent with AC characteristics being associated with the disclosure of IC information, which is important for the valuation of shares

by investors. Additionally, our results are of interest to investors and analysts as they provide a useful basis for assessing the information provided in annual reports. Finally, the results extend academic research attempting to enhance our understanding of the role of ACs in the different aspects of corporate reporting.

The findings must be interpreted in the context of a number of limitations. First, the study measures IC disclosure in annual reports only, although there are other media for IC disclosure such as websites, analyst presentations, etc. Second, the study examines a limited number of factors, and there may be other factors that affect IC disclosure practices that have not been examined in this study. For example, the engagement between the AC and external auditors can be an important factor that affects disclosure. Third, the study suffers from the usual limitations of similar studies in that they do not address issues relating to the processes by which the board or AC influences disclosure decisions. Finally, the study focuses on industry sectors considered to be IC-intensive only, which does not reflect the practice of all LSE-listed UK firms. Future research could pursue some of these avenues.

Table 1 Number of Samples by Industry Sector

	Industry Category	Population of Firms	% of total population	Sample
1	Biotechnology & Pharmaceutical (BPH)	40	12.54%	13
2	Information Technology (IT)	60	18.81%	19
3	Media & Publishing (M&P)	45	14.11%	14
4	Business Services Providers (BSP)	83	26.02%	26
5	Telecommunication Services (Telecom)	18	5.64%	6
6	Banks & Insurance (B&I)	51	15.99%	15
7	Food Production & Beverage (F&Bev)	22	6.90%	7
Total		319	100% (Round up)	100

Table 2 Dependent and Independent Variables, Measurement and Source of Information

	Variable	Operationalisation	Source	Acronym
Panel A Dependent Variables				
IC disclosure index	IC Disclosure in three presentational formats	The 61 IC items in the research instrument are scored in three presentational formats, i.e. text, numerical and graphical/pictorial, producing a total of 183 format items. The overall IC disclosure index (ICDI) is computed as the number of format items disclosed in the annual report divided by 183. The overall disclosure index is split into its three components: human capital disclosure (HICDI), structural capital disclosure (SICDI) and relational capital disclosure (RICDI).	Annual report (AR)	ICDI HICDI SICDI RICDI
Panel B Independent Variables				
Audit committee characteristics	Size of audit committee	Number of board directors on the audit committee as at the financial year end.	AR	SAC
	Frequency of audit committee meetings	Number of audit committee meetings held during the financial year of study.	AR	MAC
	Audit committee independence	Number of independent non-executive directors on the audit committee (specified in the annual report) divided by the total number of directors on the audit committee at the end of the financial year. (%)	AR	INED_AC
	Audit committee directors' shareholding	Percentage cumulative shareholdings by audit committee directors to total number of outstanding ordinary shares at the financial year end. (%)	AR	ADISH
	Audit committee financial expertise	Dummy variable with a value of 1 if one or more audit committee members have financial expertise and 0 otherwise. Financial expertise is demonstrated by previous or current employment in finance or accounting and/or membership of a professional financial or accounting body (see Smith Report, 2003).	AR	FEXP_AC
Control variables	Board independence	Number of independent non-executive directors on board (specified in the annual reports) divided by total number of directors on board at the financial year end. (%)	AR	INED
	Share ownership concentration	Percentage cumulative shareholdings by individuals or organizations classified as substantial shareholders (i.e. owning 3% or more of the firm's share capital), excluding significant directors' shareholdings, to the total number of outstanding ordinary shares at the financial year end. (%)	AR	SCON
	Listing age (length of listing on LSE)	Number of days listed scaled by 365 days a year.	LSE website	AGE
	Profitability	Return/ total assets for the financial year of study.	AR	ROA
	Firm size (sales)	Sales revenue of the financial year of study.	AR	SA

Table 3 Descriptive Statistics for Dependent and Independent Variables

		<i>Mean</i>	<i>Median</i>	<i>Min</i>	<i>Max</i>	<i>SD</i>
Panel A - Dependent variables						
Overall IC Disclosure (ICDI)		0.36	0.36	0.16	0.56	0.08
Human Capital Disclosure (HICDI)		0.355	0.348	0.212	0.561	0.073
Structural Capital Disclosure (SICDI)		0.371	0.370	0.130	0.574	0.092
Relational Capital Disclosure (RICDI)		0.365	0.349	0.111	0.667	0.122
Overall IC Disclosure (ICDI) by industry sectors ¹⁸	BPH	0.351	0.310	0.250	0.480	0.076
	IT	0.334	0.330	0.160	0.430	0.064
	M&P	0.372	0.390	0.210	0.550	0.085
	BSP	0.344	0.353	0.220	0.530	0.085
	Telecom	0.389	0.399	0.246	0.508	0.096
	B&I	0.410	0.437	0.273	0.563	0.089
	F&Bev	0.368	0.410	0.257	0.454	0.078
Panel B - Independent variables						
<i>Audit committee characteristics</i>						
Size of audit committee (number) (SAC)		3.46	3	1 ¹⁹	7	1.058
Frequency of audit committee meetings (number) (MAC)		3.70	4	1	9	1.411
Audit committee independence (INED_AC) (%)		0.848	1	0	1	0.219
Audit committee directors' shareholding (%) (ADISH)		0.016	0.00033	0.00	0.514	0.068
Audit committee financial expertise (FEXP_AC)		0.85	1	0	1	0.359
<i>Other corporate governance factors</i>						
Board independence (%) (INED)		0.475	0.500	0.180	0.750	0.125
Share ownership concentration (%) (SCON)		0.296	0.261	0	0.792	0.196
<i>Firm-specific factors</i>						
Listing age (Years) (AGE)		17.150	10.693	0.449	71.874	16.706
Profitability (%) (ROA)		0.044	0.037	-0.095	0.187	0.058
Firm size (£m) (Sales - SA)		4036.7	383.1	0.00 ²⁰	39792.2	8782.4

¹⁸ Kruskal-Wallis test was conducted. The Chi-square result is 8.63 ($p=0.195$) suggesting there are no significance differences in IC disclosure among the seven industrial sectors.

¹⁹ One company was recorded to have one member in the AC. The company had three members in the AC at the beginning of the financial year studied. However, only one member served the full financial year. The member is not an internal auditor, as the company did not have an internal audit function at the time.

²⁰ The company is an active trading company focusing on R&D. Although there were no sales recorded during 2004 financial year, contracts were signed. The company had a market capitalisation of £46 million in November 2004. Further analysis was conducted by excluding the company; the results (not tabulated) are consistent with those reported in the report.

Table 4 Correlation and Partial Correlation (Controlling for Firm Size) Matrices: Dependent and Non-categorical Independent Variables

	ICDI	HICDI	SICDI	RICDI	SAC	MAC	INED_AC	LnADISH	INED	SqSCON	LnAGE	ROA	LnSA
Panel A – Correlations													
SAC	.511***	.477***	.408***	.480***	1								
MAC	.498***	.336***	.445***	.474***	.283***	1							
INED_AC	.216**	.186*	.231**	.182*	.208**	.223**	1						
LnADISH	-.604***	-.404***	-.544***	-.541***	-.305***	-.437***	-.296***	1					
INED	.340***	.154	.367***	.313***	.234**	.185*	.112	-.337***	1				
SqSCON	-.442***	-.297***	-.437***	-.383***	-.167*	-.179*	-.254**	.238**	-.173*	1			
LnAGE	.119	.034	.195*	.089	.265***	.137	.101	-.072	.121	-.118	1		
ROA	.205***	.049	.191*	.209**	.089	.071	-.083	-.019	-.023	-.134	.216**	1	
LnSA	.704***	.621***	.568***	.642***	.485***	.510***	.259***	-.663***	.206**	-.399***	.287***	.082	1
Panel B - Partial Correlations (Control Variable - LnSA)													
SAC	.273***	.256**	.185*	.251**	1								
MAC	.228**	.028	.220**	.222**	.047	1							
INED_AC	.049	.034	.106	.022	.098	.109	1						
LnADISH	-.258***	.013	-.272***	-.201**	.025	-.154	-.0172*	1					
INED	.281***	.034	.310***	.241**	.157	.095	0.062	-.273***	1				
SqSCON	-.248**	-.068	-.279***	-.181*	.033	.031	-.0171*	-.039	-.101	1			
LnAGE	-.122	-.192*	.040	-.130	.150	-.012	0.029	.165	.066	-.004	1		
ROA	.208**	-.003	.176*	.205**	.056	.034	-.0108	.047	-.041	-.111	.201**	1	

*** Significance at the 1% level or better; ** Significance at the 5% level or better; * Significance at the 10% level or better

Variables

SAC - size of audit committee; *MAC* - frequency of audit committee meetings; *INED_AC* - audit committee independence; *LnADISH* - audit committee directors' shareholding (logarithmic transformed); *INED* - board independence; *SqSCON* - share ownership concentration (square root transformed); *LnAGE* - listing age (logarithmic transformed); *ROA* - return on assets (a proxy for profitability); *LnSA* - sales (a proxy for firm size) (logarithmic transformed).

All variables are as defined in Table 2

Table 5 Multiple Regression Results: IC Disclosure at both Overall and Component Levels

		Model 1	Model 2	Model 3	Model 4
	VIF	ICDI	HICDI	SICDI	RICDI
(Constant)		0.186 (4.872***)	0.247 (6.122***)	0.189 (3.751***)	0.108 (1.705*)
SAC	1.480	0.019 (3.255***)	0.016 (2.588**)	0.015 (2.008**)	0.028 (2.907***)
MAC	1.427	0.009 (2.103**)	0.000 (0.099)	0.011 (2.005**)	0.015 (2.065**)
INED_AC	1.195	-0.015 (-0.601)	0.002 (0.092)	-0.003 (-0.083)	-0.025 (-0.597)
LnADISH	2.141	-0.006 (-2.141**)	0.001 (0.536)	-0.008 (-2.425**)	-0.006 (-1.449)
FEXP_AC	1.361	-0.020 (-1.218)	0.013 (0.726)	-0.037 (-1.686*)	-0.035 (-1.287)
INED	1.206	0.084 (1.888*)	0.003 (0.062)	0.122 (2.077**)	0.124 (1.679*)
SqSCON	1.374	-0.007 (-2.284**)	-0.003 (-0.867)	-0.009 (-2.342**)	-0.007 (-1.433)
LnAGE	1.294	-0.012 (-2.247**)	-0.012 (-2.13**)	-0.002 (-0.294)	-0.020 (-2.324**)
ROA	1.102	0.002 (2.389**)	0.000 (0.153)	0.002 (1.716*)	0.004 (2.339**)
LnSA	2.822	0.012 (3.49***)	0.015 (4.143***)	0.006 (1.21)	0.018 (2.998***)
R		0.817	0.684	0.727	0.759
R Square		0.668	0.468	0.529	0.576
Adj. R Square		0.631	0.408	0.476	0.528
S.E.		0.050	0.053	0.066	0.084
F		17.925	7.836	9.995	12.078
Sig.		0.000	0.000	0.000	0.000

Absolute value of t-statistics in parentheses.

*** Significant at the 1% level or better; ** Significant at the 5% level or better; * Significant at the 10% level or better

Variables

SAC - size of audit committee; MAC - frequency of audit committee meetings; INED_AC - audit committee independence; LnADISH - audit committee directors' shareholding (logarithmic transformed); FEXP_AC - audit committee financial expertise; INED - board independence; SqSCON - share ownership concentration (square root transformed); LnAGE - listing age (logarithmic transformed); ROA - return on assets (a proxy for profitability); LnSA - sales (a proxy for firm size) (logarithmic transformed).

All variables are as defined in Table 2

Appendix A: Research Instrument - IC Checklist

	Human capital		Relational capital		Structural capital
1	Number of employees	1	Customers	1	Intellectual property
2	Employee age	2	Market presence	2	Process
3	Employee diversity	3	Customer relationships	3	Management philosophy
4	Employee equality	4	Customer acquisition	4	Corporate culture
5	Employee relationship	5	Customer retention	5	Organization flexibility
6	Employee education	6	Customer training & education	6	Organization structure
7	Skills/know-how/expertise/knowledge	7	Customer involvement	7	Organization learning
8	Employee work related competences	8	Company image/reputation	8	Research & development
9	Employee work-related knowledge	9	Company awards	9	Innovation
10	Employee attitudes/behavior	10	Public relation	10	Technology
11	Employee commitments	11	Diffusion & networking	11	Financial dealings
12	Employee motivation	12	Brands	12	Customer support function
13	Employee productivity	13	Distribution channels	13	Knowledge-based infrastructure
14	Employee training	14	Relationship with suppliers	14	Quality management & improvement
15	Vocational qualifications	15	Business collaboration	15	Accreditations (certificate)
16	Employee development	16	Business agreements	16	overall infrastructure/capability
17	Employee flexibility	17	Favourite contract	17	Networking
18	Entrepreneurial spirit	18	Research collaboration	18	Distribution network
19	Employee capabilities	19	Marketing		
20	Employee teamwork	20	Relationship with stakeholders		
21	Employee involvement with community	21	Market leadership		
22	Other employee features				

Source: Li et al. (2008)

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